

CHAPTER I INTRODUCTION

Just how important are lakes and ponds to New Hampshire? According to New Hampshire statistics, the tourism industry is the second biggest business in the state. In 1994, the Lakes Region was the most visited area by tourists followed by the White Mountains. It's no mystery why our lakes are important resources in New Hampshire. They provide enjoyment in fishing, swimming, and boating, and they enhance the beauty of the natural environment. Their value for tourism amounts to millions of dollars each year. The recreation and tourism industry in New Hampshire not only plays a vital role in the state economy but is essential to the survival of many local communities. However, the increased intensity of use of these waterbodies and the demand for shoreline development has resulted in the aesthetic degradation of many lakes throughout the state. The same people who were once attracted to these lakes because they were clean, clear and tranquil are now complaining of diminished quality as well as overdevelopment.

To accommodate this growth in lake use, lake watershed management has become increasingly important in the last twenty-five years. Limnologists are now educating the public to the importance of lake preservation before the resource is altered or destroyed and it becomes necessary to spend tens of thousands of dollars on lake reclamation. Limnology is now part of the curriculum for many school-aged children in hopes that the next generation will take on a new environmental awareness in lake protection.

Since the mid 1970s, the Clean Lakes Program has enabled states and local communities to work together with the federal government to improve the quality of the nation's public lakes. Created by Section 314 of the Federal Water Pollution Control Act of 1972, and amended more than a decade later by the Water Quality Act of 1987, the program has one of the longest continuous records of programs administered by the Environmental Protection Agency.

Because pollution from nonpoint sources is a major cause of lake quality problems, it is clear that a coordinated effort under Sections 314 and 319 of the Water Quality Act is critical to the successful achievement of water quality objectives at many lakes. Diagnostic/Feasibility studies performed under the Clean Lakes Program provided an excellent source of data that was used to perform watershed management through Best Management Practices (BMPs) and lake

reclamation. Nonpoint source programs provide an important partnership and vehicle to both watershed management and in-lake reclamation.

New Hampshire has used over a million dollars in Clean Lakes funding for diagnostic/feasibility studies, implementation, lake assessment, research and education, to make this state a national leader in lake protection. Unfortunately, the Clean Lakes Program has not been funded by the federal government since 1996. This may have a great effect upon New Hampshire's ability to provide the help our lakes need in the future. "Lakes seem, on the scale of years or of human life spans, permanent features of the landscape, but are geologically transitory, usually born of catastrophes, to mature and die quietly and imperceptibly" (Hutchinson, 1957). This classic statement implies that our lakes are not static, but changes in lake systems should be gradual. However, forty years after these words were written it is obvious that lakes exposed to the effects of human culture have in fact changed very rapidly and conspicuously.

Great Pond in Kingston is one of these lakes that has been severely impacted by watershed development and has suffered from the process of cultural eutrophication. The Great Pond Diagnostic/Feasibility Study began in November of 1994 and was partially funded by Section 314, Clean Lakes Program Grant. This project afforded limnologists the opportunity to study the groundwater and surface water of Great Pond and to better understand the processes of the pond's watershed.

The watershed lies in the Town of Kingston and encompasses 2075 hectares. Much of the exchange of water to the pond is from five inflowing tributaries and groundwater while the outlet and vast wetlands provide a source of water to the Merrimack River basin. Great Pond sits atop a valuable aquifer.

Clean Lakes funding was requested for this project because the Great Pond quality trends reflected increased chlorophyll and planktonic populations and an abundance of aquatic macrophyte growth. The aesthetic enjoyment of the pond and swimming are primary impairments. The pond is characterized as having clouds of filamentous algae, clumps of cyanobacteria, turbidity, rooted plant growth, high productivity and internal phosphorus loading.

Public interest in preserving Great Pond is high and the project was well received by lake association members. Volunteers in the New Hampshire Volunteer Lake Assessment Program have collected samples in the pond since 1991. Kingston State Park is located on the northeast

shore of Great Pond. This 44 acre state park receives heavy usage from both New Hampshire and Massachusetts residents. During 1991, the park attendance was approximately 37,000. Other public access facilities at Great Pond include a roadside boat launch on the southern shore along Route 111, and two YMCA camps, Blue Triangle Day Camp (5 acres) and Camp Lincoln (75 acres).

Great Pond has a public boat launch on a state owned right-of-way. Because of its location within a short distance of the state's three largest cities, Manchester, Nashua, and Concord metropolitan areas, lake reclamation and protection become an important issue to shoreland owners and to the transient population that frequents the lake via the public access. A subsequent effect of this population increase is the increasing stress on the natural resources of the area.

The effectiveness of any lake protection program is best measured through the cost/benefits to a waterbody and lake quality improvements measured by trophic status. Most successful lake protection projects are easily appreciated by people familiar with past lake quality and poor management practices.

The goal of the diagnostic study was to determine the sources of stresses to the lake by conducting watershed evaluations and in-lake monitoring. The goal of the feasibility study was to describe some of the cost-effective methods available to both improve the pond and protect it from accelerated degradation. The implementation of these recommendations will be dependent upon the initiative of state and local government, the citizens of Kingston, the shoreland owners and critical watershed caretakers and the availability of federal funding to support future projects. Partnerships between each group will be critical and cooperation of all groups will be a key element in establishing the implementation goals. One of this project's greatest goals, working together to meet the lake quality goals, still lies ahead.